00005039 8

CORRES CONTROL
INCOMING LTR NO
00277 RF 95

DUE
DATE

ACTION

DIST	LTR	ENC
BURLINGAME, A H		
BUSBY, W S		
CARNIVAL, G J		
CORDOVA, R C		
DAVIS, J G		
FENN, T M		
FERRERA, D W		
FRAY, R E		
FULTON, D L		
GEIS, J A		
GLOVER, W S		
GOLAN, P M		
HANNI, B J		
HEALY, T J		
HEDAHL, T G		
HILBIG, J G		
HOLLOWELL, L J	X	
HUTCHINS, N M		
JACKSON, D T		
KELL, R E.		
KUESTER, A W.		
MARX, G E		
McCART, D		
McDONALD, M M		
McGOVERN, L.J.		
McKENNA, F.G.		
PAUKERT, J G.		
PIZZUTO, V.M.		
POTTER, G.L		
SATTERWHITE, D.G.		
SCHRADER, D.C.		
SCHUBERT, A.L.		
SCHWARTZ, J.K.		
SETLOCK, G.H.		
STIGER, S.G.		
VOORHEIS, G.M.		
Mast, E.	X	
Bicher, C.	X	

rec'd w/o enc

CORRES. CONTROL	X	X
*ADMN RECORD/080	X	X
PATS/T130G		

Reviewed for Addressee
Corres Control RFP

1-25-95 JAO
DATE BY

Ref Ltr #

DOE ORDER # 4700.1

6522 (Rev 9/94)

Department of Energy

ROCKY FLATS OFFICE
P O BOX 928
GOLDEN COLORADO 80402-0928

JAN 25 2 14 PM '95

EG&G
ROCKY FLATS PLANT
CORRESPONDENCE CONTROL

JAN 2 4 1995

95-DOE-08048

Mr Martin Hestmark
U S Environmental Protection Agency, Region VIII
ATTN Rocky Flats Project Manager, 8HWM-RI
999 18th Street, Suite 500, 8WM-C
Denver, Colorado 80202-2405

Mr Joe Schieffelin, Unit Leader
Hazardous Waste Facilities
Colorado Department of Public Health and the Environment
4300 Cherry Creek Drive South
Denver, Colorado 80222-1530

Gentlemen

Enclosed are minutes from the January 9, 1995, meeting on the Operable Unit (OU) No 5 Contaminants of Concern (COC) Technical Memorandum (TM) No 11 comments

The comment response sheets and copies of viewgraphs are also attached to the meeting minutes The revised professional judgement sections and revised Appendix A for the OU 5 COC TM will be included in the Final COC TM

If there are any comments or questions, please call Kurt Muenchow at 966-2184

Sincerely,

Steven W Slaten
IAG Project Coordinator
Environmental Restoration

Enclosure

cc w/o Enclosure
C Gesalman EM-453 HQ
K Klein, OOM, RFFO
K Muenchow, ER RFFO
C Spreng, CDPHE
B Lavelle EPA
E Mast EG&G
C Bicher, EG&G

ADMIN RECORD

A 0U05-000663

Meeting Date/Time: January 9, 1995/0830

Meeting Location Advanced Sciences, Inc (ASI), Lakewood, CO

Meeting Subject: Resolution of Comment Responses on Contaminants of Concern (COC) TM, Operable Unit No 5, Rocky Flats Environmental Technology Site

Attendees:

Name	Affiliation
Carol Bicher	EG&G
Win Chromec	EG&G
Robert Cygnarowicz	EG&G
Doug Dennison	ASI
Mary Lee Hogg	ICF Kaiser
Scott Hollowell	EG&G
Mike Kelly	Dames & Moore
Bonnie Lavelle	EPA
Theresa Lopez	PRC
Diane Niedzwiecki	CDPHE
Rotha Randall	EG&G
Mary Siders	EG&G
Steve Slaten	DOE/RFFO
Carl Spreng	CDPHE

Copies of materials that handed out during this meeting were the comment response sheets (Attachment 3), the viewgraphs (Attachment 4), the revised Appendix A, and revised professional judgement sections for each medium Copies of the latter two items are not attached, but will be copied to the Administrative Record

Introduction- C Bicher restated the purpose of this meeting, the critical nature of the schedule for finalizing the COC TM, and presented the meeting agenda (Attachment 2)

A **Open Issues from December 7, 1994 Data Aggregation Meeting**

1 **C Bicher** - Discussed the open issues from the December 7, 1994 data aggregation meeting The first issue concerns CDPHE's agreement to address the Surface Disturbance West of IHSS 209 in the uncertainty analysis portion of the risk assessment. Discussed that in phone conversation with Joe Schieffelin, he indicated that he agreed with this approach

D Niedzwiecki - Confirmed that she had a similar discussion with Joe Schieffelin in which he also stated agreement with this approach

2 **C. Bicher**- The second issue concerns CDPHE's agreement to the streamlined risk assessment approach to the Original Landfill (IHSS 115/196) resulting from the presumptive remedy approach Discussed that in a phone conversation with Joe Schieffelin, he indicated that, if the presumptive remedy is the appropriate approach for the Original Landfill, he agreed with the streamlined risk assessment

D. Niedzwiecki - Confirmed that she had a similar discussion with Joe Schieffelin in which he also stated agreement with the streamlined risk assessment

C Bicher - Discussed that it appears, however, that it may be more prudent to continue with a traditional baseline risk assessment (BRA) for IHSS 115/196 due to the cost and time required to adjust the risk assessment at this point in the process

B. Lavelle - Stated that she did not feel that this approach is appropriate If MCLs are exceeded, there is no need for a traditional BRA

B Cygnarowicz - Explained that new geologic characterization work has indicated that there is the potential that a fault exists in the area of the Original Landfill which may preclude the presumptive remedy approach It may be more prudent to proceed with the traditional BRA and analysis of remedial alternatives until such time it is determined whether a fault exists and, if it does, how it may impact remedial decisions

B Lavelle - Discussed that the risk assessment needs to answer two questions 1) Do we need to do anything to remediate a site? and 2) If so, what drives the risk at the site? It may be helpful for the Feasibility Study (FS) to analyze other alternatives

B Cygnarowicz - Discussed that the RI and FS teams will begin to work more closely together and discuss potential remedial alternatives

D. Niedzwiecki - Stated that Joe Schieffelin has expressed a desire to allow some flexibility in risk analysis

M L. Hogg - Questioned whether analysis of residential exposure at the Original Landfill could be viewed as a bounding risk

B. Lavelle - Stated that EPA Region VIII would rather look at a reasonable maximum exposure We need to look at realistic exposure scenarios

D. Niedzwiecki - Questioned whether a risk assessment is really necessary at the Original Landfill

W. Chromec - Stated that due to uncertainties regarding the presumptive remedies at the landfill, it would be better to proceed with a traditional BRA

M. Siders - Discussed how stratigraphic marker beds have been used to identify potential faults Discussed the investigation of a fault in OU7 using trenching and that any investigation of potential faults requires trenching or borings

C. Bicher - Discussed that the geotechnical drilling project ongoing at the Original Landfill will provide additional information for identification of potential faults

B Cygnarowicz - Restated that the presumptive remedy is still a remedial option for the Original Landfill but may not be the only option In order to address all possible scenarios, some additional effort spent on the BRA now may result in less time expended overall

C. Bicher - Stated that the most conservative approach would be to proceed with the BRA

B. Lavelle - Agreed that this would be the most prudent approach but desires that the most reasonable maximum exposure scenario(s) be considered If a residential scenario is reasonable, it should be included

B. Cygnarowicz - Stated that the presumptive remedy report will include a DSA-level analysis of alternatives

B. Lavelle - Questioned whether planned exposure scenarios for the Original Landfill are included in the revised draft final Exposure Assessment TM (EATM)

C. Bicher - Stated that the revised draft final EATM does address exposure scenarios for the Original Landfill

B. Lavelle - Questioned whether anyone from EPA is working with EG&G on the identification of potential faults

C. Bicher - Stated that she would contact Connie Dodge, EG&G, to determine whether anyone from EPA is currently involved with this project

B Cygnarowicz - Discussed the result of the trenching performed in OU7 Stated that wells near the trench were dry, but when the trench was constructed water was found

within the fracture Discussed that similar conditions could be present in OU5 and that the potential exists for a contaminant migration pathway

3 **C Bicher** - Discussed the remaining open issue which concerns the amount of surface water and sediment data that have been included in the data set evaluated for OU5

D. Dennison - Confirmed the discussions from the December 7, 1994 meeting that, to a limited extent, data from site-wide programs and other OUs was used. Data that was collected from these programs during the same time span as the OU5 sampling program was used

B <u>Comments on Draft Final COC TM</u>

1 **D Dennison** - Discussed the approach used in responding to comments received from EPA and CDPHE on the draft final COC TM This approach consisted of addressing each of the agency's comments on comment response forms (Attachment 3) and providing revised text for those sections dealing with the selection of PCOCs (see Attachment 4 for the viewgraphs which summarize the text revisions) This approach was used because the selection of PCOCs is the area where most discussion occurs Once the PCOCs have been selected, the determination of COCs is relatively straight forward

B. Lavelle/D. Niedzwiecki - Stated that they would like to review the comment responses for a few days before stating agreement to the responses

M Kelly - Discussed the comments received from EPA and CDPHE specific to the concentration toxicity screens The responses to these comments are provided in Attachment 3 Discussions specific to particular comments is provided below

B Lavelle - In regard to EPA's comment concerning the cancer slope factor (CSF) for arsenic (second comment on Page 1 of 8, Attachment 3), questioned what is the issue

M L. Hogg - The CSF recommended by EPA, 50 (milligrams per kilogram-day)$^{-1}$, is appropriate for use in forward calculations of risk, but the value of 15 (milligrams per kilogram-day)$^{-1}$ used in the COC TM is more appropriate for use in concentration toxicity screening This is due to the fact that absorption cannot be easily addressed in the concentration toxicity screen

B. Lavelle - Stated that she would consult EPA's toxicologist, Dr Chris Weiss, regarding this issue

M. Kelly - Discussed the response to EPA's comment regarding the treatment of potential COCs without toxicity values This response proposes that these chemicals will be addressed in the uncertainty analysis portion of the risk assessment

B Lavelle/D. Niedzwiecki - Agreed with this approach

2 **D. Dennison** - Discussed the statistical evaluation of data and the identification of PCOCs (See Attachment 4 for details of this discussion) Discussed that, in response to comments received from EPA and CDPHE, the professional judgement (i e , spatial, temporal, and geochemical evaluations) step was now performed prior to the concentration toxicity screens Also discussed that the statistical analysis of the data was reevaluated to address the issue of detection frequency (if less than 20% detected values were present in either the background or OU5 data sets, no statistical test were performed) and to confirm the conclusions made previously based on this analysis

B. Lavelle - Questioned whether the 20% detected values criteria for the performance of the statistical tests is consistent with Dr Gilbert's recommendations

D Dennison - Stated that, in his letter report, Dr Gilbert does not recommend a minimum frequency of detection for the performance of all statistical tests but does have such criteria for some of the individual statistical tests Also stated that Dr Gilbert and many other authors generally recommend that a greater frequency of detection, in the range of 40 to 50%, is necessary to get valid results from most statistical tests Stated that the Gehan Test appears to give suspect results when there is a large number of non-detects Reiterated that when data were lacking to justify the elimination of a particular constituent as a PCOC, a conservative approach was used, and the constituent was retained for further evaluation Presented the results of the statistical evaluations for each medium as discussed below (see Attachment 4 for detail)

<u>Surface Soils</u>

No discussion regarding the statistical evaluations

<u>Subsurface Soils</u>

B. Lavelle - Discussed that manganese is considered to be an essential nutrient by EPA if the concentration does not exceed the recommended daily allowance Stated that this argument could be used to eliminate manganese as a COC, if necessary

<u>Groundwater</u>

No discussion regarding the statistical evaluations

Surface Water

No discussion regarding the statistical evaluations

Seep Water

No discussion regarding the statistical evaluations

Pond Sediments

No discussion regarding the statistical evaluations

Seep Sediments

No discussion regarding the statistical evaluations

Stream Sediments

M.L. Hogg - Questioned whether the relatively high result for tritium in a sample from the South Interceptor Ditch (SID) was qualified

D. Dennison - Stated that he would check the qualifiers for this sample (Subsequent to this meeting, the qualifiers were checked The sample was qualified by the validation contractor as being acceptable with the following qualifications - 1 Replicate precision criteria were not met, 2 Lab control samples > +/- 3 sigma, and 3 tSIE criteria were not met)

3 **D. Dennison** - Discussed the approach used in revising the COC TM in response to comments received from EPA and CDPHE regarding professional judgement Stated that the COC TM was revised to reference TM15 which has numerous maps and other figures that support the discussions of PCOCs Also reiterated that the professional judgement sections of the COC TM were moved to the beginning of the sections of the TM discussing each medium Also stated that, as with the statistical evaluation, a conservative approach was used in applying professional judgement In the absence of adequate evidence to support the elimination of a chemical as a PCOC, the chemical was retained Stated that essential nutrients, calcium, iron, magnesium, potassium, and sodium, were eliminated as PCOCs for all media Presented the results of the professional judgement evaluation for each medium as discussed below (see Attachment 4 for details)

Surface Soils

No discussion regarding professional judgement.

Subsurface Soils

No discussion regarding professional judgement

Groundwater

D. Dennison - Discussed that the limited number of groundwater samples precludes meaningful spatial and temporal evaluations of the data

M. Siders - Recommended that the number of samples (N) represented by the data presented on Table 5-1 be included in the table

Surface Water

B Lavelle - Questioned how many samples were averaged for the information presented on Figure 6-1

D. Dennison - Stated that at each sampling location, two low-flow and one high-flow sampling events were represented

B Lavelle - Stated that patterns of data during low and high flows will be discussed further in the EE

Seep Water

D Dennison - Stated that no chemicals were identified as being present in concentrations exceeding background by the statistical analysis, therefore, no professional judgement was employed

Pond Sediments

No discussion regarding professional judgement

Seep Sediments

No discussion regarding professional judgement

Stream Sediments

No discussion regarding professional judgement

4 **C. Bicher** - Stated that it was assumed that EPA and CDPHE would like to have time to review the comment responses and questioned the time-frame for receiving comments from the agencies

B. Lavelle - Stated that EPA would try to respond by Friday, January 13, or Tuesday, January 16

B Lavelle - Questioned whether the revisions to the COC TM will affect the CDPHE letter report

C. Bicher/M. Kelly - Stated that, at this time, these changes are not expected to affect the CDPHE letter report

Summary - The following action items resulted from this meeting

1 Carol Bicher, EG&G, agreed to contact Connie Dodge, EG&G, to determine if anyone from EPA is participating in the identification of potential faults

2 Bonnie Lavelle, EPA, agreed to contact Dr. Chris Weiss, EPA, regarding the appropriate slope factor to be used in the concentration toxicity screen for arsenic

3 EPA and CDPHE agreed to review the responses to their comments on the COC TM and provide any additional comments

ATTACHMENT 2

MEETING AGENDA
COC TM COMMENT RESPONSE
OPERABLE UNIT NO. 5

January 9, 1995 8:30 a.m.
Advanced Sciences, Inc.
Lakewood, Colorado

INTRODUCTION ..... C. BICHER, EG&G
D. DENNISON, ASI

MEETING MINUTES FROM DEC. 7, 1994 DATA
AGGREGATION MEETING ..... C. BICHER, EG&G

OPEN ISSUES FROM DEC. 7, 1994 DATA
AGGREGATION MEETING ..... C. BICHER, EG&G

- Streamlined Approach to IHSS 115/196 Risk Assessment
- Proposal to Address Surface Disturbance West of IHSS 209 in Uncertainty Analysis
- Determination if additional surface-water and/or sediment data are available from other OUs

DISCUSSION OF COMMENTS ON DRAFT FINAL COC TM

- Response to General Comments & Comments on Concentration-Toxicity Screens ..... M. KELLY, DAMES & MOORE
- Response to Comments on Statistical Evaluations of Data ..... D. DENNISON, ASI
- Response to Comments on Professional Judgement Sections of TM ..... D. DENNISON, ASI

DISCUSSION

REVIEW COMMENT SHEET

Return to Carol Bicher
8663 FAX | OU 5,6, and 7 Closures Name | 9100 Ext | 080 Location | Reviewer Bonnie Lavelle, EPA

Please review the attached procedure COC TM Number | Rev | Draft-Final Draft

Title OU5, Tech Memo No 11, Contaminants of Concern

Comment Due Date _____

[X] Internal Review [ ] Parallel Review [ ] Verification [ ] Validation [ ] Revalidation

General (G) comments require resolution but do not require resolution acceptance Mandatory (M) comments require resolution and resolution acceptance
1-88000-PP-004 provides complete definitions of General and Mandatory comments

ITEM G or M	PAGE	SECTION OR STEP	COMMENT	RESOLUTION	Resolution accepted INIT/DATE
M	2-1	2 1	This section should include summary tables of descriptive statistics for all data used to select COCs The summary tables should include the range of reporting limits, frequency of detection, minimum non-detect value, maximum non-detect value, minimum and maximum detected values, mean concentrations and upper 95 percent confidence limit concentrations This information is needed to evaluate detection limits and assess the range of detected values to determine if the data adequately characterize the site	The risk assessment will use 95% UCLs for the highest AOC grid placement and an AOC wide 95% UCL Therefore OU-wide 95% UCLs have not been calculated and will not be used in the risk assessment. Summary tables of descriptive statistics for each medium were added to this section. In addition, the discussion in Appendix A was revised to address the issue of detection frequency and detection limits in greater detail.	
M	2-7	Table 2-1	The inhalation cancer slope factor (CSF) for arsenic is incorrect. The correct value is 50 (milligrams per kilogram-day)$^{-1}$ because the CSF was derived assuming a 30 percent bioavailability via lung tissue A memorandum explaining the conversion of unit risk to CSF for arsenic is enclosed with this review The value of 50 should be used in the concentration toxicity screen (CTS) for soil and sediment	This issue has been informally discussed with EPA. The current CSF for arsenic will be maintained pending a programmatic decision by DOE	

REVIEW COMMENT SHEET

Return to Carol Bicher
8663 FAX | OU 5,6, and 7 Closures Name | 9100 Ext | 080 Location

Reviewer Bonnie Lavelle, EPA

Please review the attached procedure COC TM Number | Rev. | Draft-Final Draft

Title OU5, Tech Memo No 11, Contaminants of Concern

Comment Due Date _____

[X] Internal Review [ ] Parallel Review [ ] Verification [ ] Validation [ ] Revalidation

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ITEM G or M	PAGE	SECTION OR STEP	COMMENT	RESOLUTION	Resolution accepted INIT/DATE
M	2-12	Second Paragraph	This paragraph states that only the oral noncarcinogenic toxicity value for nickel was used in the CTS for ground water and that nickel was not considered a carcinogen Nickel is classified as a known human carcinogen (Class A). For this screening analysis, the most conservative toxicity value should be used according to EPA's Risk Assessment for Superfund, Part A Nickel should be evaluated as a carcinogen.	In researching this issue, the only evidence of nickel use at RFETS is in the form of nickel carbonyl The nickel carbonyl gas was destroyed by burning, either in the 1957 fire in Building 771 or by explosive charges One of the locations where this compound was destroyed, IHSS 195 in OU16, is included in the No Further Action Record of Decision for this operable unit. The Final No Further Action Justification Document for OU16 presents a strong case for alleviating concern that nickel exists at RFETS in a potentially carcinogenic form The only forms of nickel known to be carcinogenic are nickel refinery dust and nickel subsulfide via the inhalation route The limited toxicity information on nickel carbonyl available on IRIS indicates that this compound is a probable human carcinogen. This is	

REVIEW COMMENT SHEET

Return to Carol Bicher
8663 OU 5,6, and 7 Closures 9100 080
FAX Name Ext Location

Reviewer: Bonnie Lavelle, EPA

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Number Rev Draft

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Comment Due Date _____

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ITEM G or M	PAGE	SECTION OR STEP	COMMENT	RESOLUTION	Resolution accepted INIT/DATE
M	2-12	Second Paragraph (continued)		based upon observation of pulmonary carcinomas and malignant tumors at various sites in rats administered nickel carbonyl by inhalation and intravenous injection Although this compound is suspected of causing lung cancer in humans through the inhalation route, there is inadequate data for human carcinogenicity. The low survival rate for both control and treated animals in the rat studies preclude a quantitative risk estimate, therefore, no toxicity values (either RfD/RfC or slope factors) are available. In addition, several studies summarized in the Hazardous Substance Data Base report that low absorption from the GI tract causes nickel compounds to be essentially nontoxic after ingestion	

REVIEW COMMENT SHEET

Return to. Carol Bicher
8663 FAX | OU 5,6, and 7 Closures Name | 9100 Ext. | 080 Location

Reviewer Bonnie Lavelle, EPA

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ITEM G or M	PAGE	SECTION OR STEP	COMMENT	RESOLUTION	Resolution accepted INIT/DATE
M	2-12	Second Paragraph (continued)		Nickel carbonyl exists as a flammable gas or as a colorless liquid. Nickel carbonyl is highly volatile at room temperature and readily decomposes in the presence of oxygen. In fact, oxidation is so rapid that combustion and/or explosion occur in air. Oxidizing agents rapidly decomposes the vapor, liberating carbon monoxide and forming a corresponding nickel salt The resulting salt will depend on the ambient conditions and available atmospheric compounds present at the time of decomposition. Residual nickel can combine with oxygen in the atmosphere to form very fine-grained nickel oxide And, under ambient conditions in moist air, it can decompose to form nickel carbonate In the atmosphere at concentrations near the ppb level, nickel carbonyl has a half-life of about 30 minutes	

REVIEW COMMENT SHEET

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ITEM G or M	PAGE	SECTION OR STEP	COMMENT	RESOLUTION	Resolution accepted INIT/DATE
M	2-12	Second Paragraph (continued)		Because of the above physical properties and fate and transport characteristics of nickel carbonyl, it is unlikely that any of this compound remains onsite after 20 years. Therefore, both the inhalation and ingestion routes of exposure to human receptors are incomplete and nickel should not be evaluated as a carcinogen.	
M	2 12	Third Paragraph	This paragraph explains how potential COCs without toxicity values will be evaluated The text should clearly state that these chemicals will be retained as COCs and evaluated qualitatively in the baseline risk assessment The CTS results for each medium indicate that chemicals without toxicity values are not COCs Any chemical without a toxicity value should be retained as a COC and qualitatively evaluated in the baseline risk assessment These chemicals should be added to the COC list.	A table will be created that identifies PCOCs without toxicity information The subject PCOCs will then be addressed in the uncertainty analysis in the HHRA	

SENT BY: JAMES M MOORE

REVIEW COMMENT SHEET

Return to Carol Bicher
8663 FAX | OU 5,6, and 7 Closures Name | 9100 Ext | 080 Location

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ITEM G or M	PAGE	SECTION OR STEP	COMMENT	RESOLUTION	Resolution accepted INIT/DATE
M	A-1	Appendix A, Section A-1	The text should explain how "U" qualified data were evaluated for each medium and for the background data It should also describe how the blank data were used The "10 times" and "5 times" rules should have been used to determine whether chemicals detected in both site and blank samples are attributable to blank contamination	The text of the last bullet of the last paragraph of Section A 1 includes a discussion of how "U" qualified data were evaluated and used for the background comparisons. The text of Section A.3 was revised to reflect the fact that the formal statistical tests (i.e. the Gilbert tests) were not performed for inorganic constituents when greater than 60 percent non-detects were present in either the background or the OU data set. For those constituents where the rate of non-detects was greater than 60 percent, the OU and background data were evaluated qualitatively through the use of graphics and spatial, temporal, and pattern recognition evaluations. This evaluation, in conjunction with the risk-based concentration (RBC) comparison, described in Section 2.7 of the document, were used to identify "hot spot" contaminants that were not eliminated as PCOCs The cut-off value of 60 percent for non-detects has been used for various Rocky Flats reports and may be, based on a review of recommendations of several statisticians, a relatively high value. Gilbert and Simpson (1987) state that statistical comparisons of data sets where one or both data sets have high non-detect rates or high-value non-detects may well be an invalid use of statistical tests Helsel (1990) notes "...the fabrication of data followed by a t-test must be considered too arbitrary for use, especially for legal or management decision purposes and should be avoided." The "fabrication of data" is here the same as "replacement of non-detect data" or censoring the data Helsel (1990) defines a "small" amount of censoring as less than 20-percent non-detects	

REVIEW COMMENT SHEET

Return to Carol Bicher
8663 OU 5,6, and 7 Closures 9100 080
FAX Name Ext. Location

Reviewer Bonnie Lavelle, EPA

Please review the attached procedure COC TM Draft-Final
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Comment Due Date. _____

Title. OU5, Tech Memo No 11, Contaminants of Concern

[X] Internal Review [ ] Parallel Review [ ] Verification [ ] Validation [ ] Revalidation

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ITEM G or M	PAGE	SECTION OR STEP	COMMENT	RESOLUTION	Resolution accepted INIT/DATE
M	A-6	Appendix A, Third Paragraph	This paragraph describes the Quantile test used in the background comparison and states "If there were any non-detects among the top 20% of the measurements, no Quantile test was used." This methodology is not consistent with the recommendations of Dr Richard O Gilbert in his latter report to DOE. In that report, he states "The quantile test can be used...when non-detects are present in one or both of the data sets, but all non-detects are less than the rth largest measurement (counting down from the largest measurement) in the combined background and OU data sets." He further suggests, "When there are multiple non-detects, some of which are greater than the rth largest measurement the recommended procedure is to rank the combined data sets using the ranking procedure appropriate for the Gehan test."	The text of Appendix A of this document reflects how the Quantile test was applied for OU5 and is consistent with "Guide for Conducting Statistical Comparison of RFI/RI Data and Background Data at Rocky Flats Plant," Appendix A of the August 1994 Final Human Health Risk Assessment Template.	
M	A-6	Appendix A Fourth Paragraph	This paragraph discussed the use of the t-test as part of the background comparison. It states that the t-test was conducted only when there were at least 80 percent detects. This restriction on the use of the test should be explained. If one-half the sample quantitation limit is used as a proxy value for non-detects then the t-test can be used for all chemicals. Additionally the text states that the t-test was not conducted on data sets containing fewer than 20 samples. This is also an arbitrary requirement. While the power of the t-test, or any statistical test, increases with increasing sample size, a data set with fewer than 20 samples may still be large enough to be used in the statistical analysis. For example, the following data sets have fewer than 20 samples: Surface soil: Background radionuclides, cadmium, and mercury	The text of Appendix A of this document reflects how the t-test was applied for OU5 and is consistent with "Guide for Conducting Statistical Comparison of RFI/RI Data and Background Data at Rocky Flats Plant," Appendix A of the August 1994 Final Human Health Risk Assessment Template	

REVIEW COMMENT SHEET

Return to Carol Bicher
8663 OU 5,6, and 7 Closures 9100 080
FAX Name Ext. Location

Reviewer Bonnie Lavelle, EPA

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ITEM G or M	PAGE	SECTION OR STEP	COMMENT	RESOLUTION	Resolution accepted INIT/DATE
M	A 8	Appendix A, Fourth Paragraph (cont.)	Groundwater OU 5 radionuclides (total and dissolved), OU 5 metals (total and dissolved), background total plutonium-238, total radium 226, dissolved americium-241 and dissolved plutonium-238/240. Other data sets also have fewer than 20 samples. For the most part, the t test could have been applied and would have produced accurate results. The methodology surrounding the use of the t-test should be more fully explained		

POC/Reviewer (Comments not signed by Reviewer/POC will be considered unofficial and not subject to resolution)

- ☐ No Comments
- ☐ This procedure revision has no impact or relevance to our discipline or organization and we waive need to concur We acknowledge this concurrence waiver does not affect our responsibility to implement the requirements of this procedure when needed

Bonnie Lavelle, EPA _____
Name Signature

_____ _____ _____
Ext./Pager/Fax Bldg./Dept./AGM Date

Resolutions Accepted·

_____ _____
Signature Date

If questions on content, please call the SME

Win Chromec 8641/5144
Name Ext.

NOTE. These reviews will be completed by qualified reviewers in accordance with 1-88000-PP-004 in concert with 1-88000-PP-001 and 1-88000 PP-003

REVIEW COMMENT SHEET

Return to Carol Bicher
8683 OU 5,6, and 7 Closures 9100 080
FAX Name Ext. Location

Reviewer Joe Schieffelin, CDPHE

Please review the attached procedure COC TM Draft-Final
Number Rev Draft

Title OU5, Tech Memo No.11, Contaminants of Concern

Comment Due Date _____

[X] Internal Review [ ] Parallel Review [ ] Verification [ ] Validation [ ] Revalidation

General (G) comments require resolution but do not require resolution acceptance. Mandatory (M) comments require resolution and resolution acceptance 1-88000-PP-004 provides complete definitions of General and Mandatory comments.

ITEM G or M	PAGE	SECTION OR STEP	COMMENT	RESOLUTION	Resolution accepted INIT/DATE
M	2-4		Please strike the underlined phrase in the sentence "Organic contaminants were assumed to be anthropogenic in origin and attributable to background, therefore, any organic contaminant detected is considered a potential contaminant of concern (PCOC) "	Phrase deleted, also deleted the spelling out of PCOC (spelled out previously)	
M	2-15		The text on this page states that the construction worker exposure to subsurface soil rather than residential exposure to subsurface soil was assumed However, Table 4-4, lists residential RBC values. The Division believes that Table 4-4 is correct and that the text should be made consistent with the table	The sentence referring to the construction worker will be deleted Surface soil will be changed to soil in the preceding sentence	
M		Table 4-4	The RBC for 2-Methylphenol was listed instead of the RBC for 4-Methyl-2-Pentanone Table 4-4 should be changed to correctly list the RBC for 4-Methyl-2-Pentanone	The RBC, will be corrected to 2 2 E+4 for 4-Methyl-2-Pentanone	

REVIEW COMMENT SHEET

Return to Carol Bicher
8663 OU 5,6, and 7 Closures 9100 080
FAX Name Ext. Location

Reviewer: Joe Schieffelin, CDPHE

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Number Rev Draft

Title OU5, Tech Memo No 11, Contaminants of Concern

Comment Due Date _____

[X] Internal Review [ ] Parallel Review [ ] Verification [ ] Validation [ ] Revalidation

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ITEM G or M	PAGE	SECTION OR STEP	COMMENT	RESOLUTION	Resolution accepted INIT/DATE
M	2-15		The Division is concerned about the application of professional judgement after the concentration-toxicity screen The use of professional judgement was discussed at the 12/7/94 OU 5 meeting, and EG&G and subcontractors doing the COC selection process agreed to move the professional judgement step before the concentration-toxicity screen. This document needs to be revised accordingly.	The COCTM will be updated to include professional judgement during the background comparison step	
M			At the 12/7/94 meeting, EG&G and contractors also agreed to send the Division copies of the histograms, box plots, maps, etc., especially for those chemicals which were eliminated by professional judgement This has not yet occurred, but needs to occur before the revised version of this TM is submitted to the Division for review	Appendix A was revised to include, as appropriate, box plots, histograms, and other graphical presentations of the data for constituents that were either eliminated or included as PCOCs on the basis of the graphics	

REVIEW COMMENT SHEET

Return to Carol Bicher
8663 FAX | OU 5,6, and 7 Closures Name | 9100 Ext. | 080 Location | Reviewer Joe Schieffelin, CDPHE

Please review the attached procedure: COC TM Number | Rev | Draft-Final Draft

Title OU5, Tech Memo No 11, Contaminants of Concern

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ITEM G or M	PAGE	SECTION OR STEP	COMMENT	RESOLUTION	Resolution accepted INIT/DATE
M	4-7		There has been a considerable amount of discussion concerning the presence of manganese oxides and whether or not this is a naturally occuring material The Division believes that these oxides should be screened in the same manner as all other analytes, including previously agreed-upon background comparison methods, before alternate professional judgement methods are applied In contract, however, DOE continues to compare the metal with the range of background values in order to eliminate it as a COC We do not think this is appropriate. Let's let the numbers that emerge from the agreed-upon methodology speak for themselves before departing into the contentious world of professional judgement.	Appendix A was revised to reflect the re-evaluation of the results of the statistical tests and graphics This re-evaluation resulted in manganese and barium being eliminated as PCOCs Therefore the discussion regarding the presence of manganese oxides has been deleted from the text. It should be noted that the August 1994 Final Human Health Risk Assessment Template allows for the application of professional judgement to ascertain whether a constituent identified by the statistical tests as being present in concentrations exceeding background constitutes contamination. It should also be noted that Gilbert and other statisticians warn against applying any statistical tests in a cook-book fashion without employing professional judgement to determine if the results make sense scientifically (for example, see R O Gilbert and J.C. Simpson, 1992, *Statistical Methods for Evaluating the Attainment of Cleanup Standards: Volume 3. Reference-Based Standards for Soils and Solid Media*, prepared for the EPA, Statistical Policy Branch.)	

REVIEW COMMENT SHEET

Return to Carol Bicher
8663 OU 5,6, and 7 Closures 9100 080
FAX Name Ext Location

Reviewer Joe Schieffelin, CDPHE

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Number Rev Draft

Title: OU5, Tech Memo No 11, Contaminants of Concern

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ITEM G or M	PAGE	SECTION OR STEP	COMMENT	RESOLUTION	Resolution accepted INIT/DATE
M	5-5		Groundwater. EG&G stated in the 12/7/94 meeting that they would supply r^2 values so that Division can better evaluate these correlations. This has not yet occurred, but needs to occur before the revised version of this TM is submitted to the Division for review.	The text and figures of Section 5 0 were revised to include correlation coefficients for metals and total suspended solids (TSS), as appropriate	
M	5-8		Groundwater: Please clarify when, and under what rationale, beryllium was removed from the COC list It was in the list of PCOCs and was responsible for 84 4% of the carcinogenic risk in the concentration-toxicity screen. No rationale for its elimination as a COC was discussed, yet it is not in the final list of COCs	The omission of beryllium from the discussion of metals concentrations versus TSS was an error. The professional judgement section for groundwater (now Section 5 1) was revised to address beryllium.	

REVIEW COMMENT SHEET

Return to Carol Bicher
8663 OU 5,6, and 7 Closures 9100 080
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Reviewer: Joe Schieffelin, CDPHE

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ITEM G or M	PAGE	SECTION OR STEP	COMMENT	RESOLUTION	Resolution accepted INIT/DATE
M	8-6		Pond sediments: Manganese was eliminated as a COC in pond sediments based primarily on an argument that the concentrations in the six pond sediment samples were all below the maximum concentrations detected for both background stream sediments and background seep sediments (in the absence of any background data for pond sediments) They were all below the UTL 99/99 indicating no hot spots However, the Gehan test indicated a significant difference between pond and stream sediment concentrations and the t-test indicated a significant difference between pond and seep sediments Thus both a nonparametric ANOVA test and this t-test indicate that the means are significantly different This difference in means should be the criteria used for comparison, rather than the comparison with a background range In addition, because the background sediment values were collected in streams and seeps, which may not be strictly comparable to pond sediments, it may be more prudent not to eliminate chemicals using this type of rationale	The discussion of metals concentrations in pond sediments was revised to more closely reflect the results of the statistical tests. Due to the lack of comparable background data for pond sediments, a conservative approach to identifying PCOCs for pond sediments was used. This approach resulted in retaining all inorganic species identified as exceeding background concentrations for either stream sediments or seep sediments as PCOCs. Please note that the results of the t-test for pond sediments are no longer reported in Appendix A As is discussed in "Guide for Conducting Statistical Comparison of RFI/RI Data and Background Data at Rocky Flats Plant," Appendix A of the August 1994 Final Human Health Risk Assessment Template, the t-test is not appropriate for use with a data set containing less than 20 data points The other inferential statistical tests were applied as appropriate, for pond sediments	
M	9-5		Seep sediments. Please clarify the rationale for eliminating antimony and beryllium as COCs	The text of Section 9 0 was revised to reflect that antimony and beryllium are being retained as PCOCs	

REVIEW COMMENT SHEET

Return to Carol Bicher

8663	OU 5,6, and 7 Closures	9100	080
FAX	Name	Ext.	Location

Reviewer Joe Schieffelin, CDPHE

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Number Rev Draft

Title OU5, Tech Memo No 11, Contaminants of Concern

Comment Due Date: _____

[X] Internal Review [ ] Parallel Review [ ] Verification [ ] Validation [ ] Revalidation

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ITEM G or M	PAGE	SECTION OR STEP	COMMENT	RESOLUTION	Resolution accepted INIT/DATE
G			General Comment: The Division believes that all parties need to keep in mind that Woman Creek is the sink for the whole southern part of the plant. Therefore, we need to consider more than just sources and contaminants found within OU 5 Even though it may be true that metals are naturally occurring, we believe it would be better to retain chemicals as COCs, exercise less professional judgement to eliminate them, and evaluate the risk of what is there. Once again, let's let the numbers speak for themselves	As indicated in the responses to several of the comments above, the evaluations of the statistical tests described in Appendix A and the professional judgement for each medium have been revised, as appropriate, to further justify the inclusion or elimination of constituents as PCOCs The result of this re-evalution has been the inclusion of more constituents as PCOCs and, subsequently, as COCs	

POC/Reviewer (Comments not signed by Reviewer/POC will be considered unofficial and not subject to resolution)

- ☐ No Comments
- ☐ This procedure revision has no impact or relevance to our discipline or organization and we waive need to concur We acknowledge this concurrence waiver does not affect our responsibility to implement the requirements of this procedure when needed

Joe Schieffelin, CDPHE _____ _____

Name Signature

_____ _____ _____

Ext./Pager/Fax Bldg./Dept./AGM Date

Resolutions Accepted

_____ _____

Signature Date

If questions on content, please call the SME.

Win Chromec 8641/5144

Name Ext

NOTE. These reviews will be completed by qualified reviewers in accordance with 1-88000-PP-004 in concert with 1-88000-PP-001 and 1-88000-PP-003

OU5 RFI/RI - JANUARY 9, 1995

STATISTICAL ANALYSIS OF DATA

- Statistical tests were not used when < 20% detects in either background or OU5 data sets
- Gehan Test
- Slippage Test
- Quantile Test
  - Not used when there were any non-detects among the top 20% of measurements
- t-Test
  - Not used when data sets contain less than 20 points or data are not normally distributed
- Graphics (box-and-whisker, histograms, etc.) used to support results of statistical tests

OU5 RFI/RI - JANUARY 9, 1995

STATISTICAL ANALYSIS - SURFACE SOILS

Inorganic Analytes Determined to be Statistically Above Background

- Americium-241
- Uranium-233/234
- Uranium-238
- Cobalt
- Lead
- Silver
- Plutonium-239/240
- Uranium-235
- Antimony
- Copper
- Mercury
- Zinc

- Americium-241 and antimony retained based on graphics
- Uranium-235, lead, mercury, silver, and zinc retained based on hot-measurement test

OU5 RFI/RI - JANUARY 9, 1995

STATISTICAL ANALYSIS - SUBSURFACE SOILS

Inorganic Analytes Determined to be Statistically Above Background

- Americium-241
- Uranium-233/234
- Uranium-238
- Beryllium
- Chromium
- Copper
- Lead
- Nickel
- Zinc
- Plutonium-239/240
- Uranium-235
- Antimony
- Cadmium
- Cobalt
- Iron
- Molybdenum
- Silver

- Antimony, beryllium, cadmium, chromium, molybdenum, nickel and silver retained based on hot-measurement test
- Calcium, potassium, sodium, and strontium concentrations in background greater than in OU5
- Distributions of arsenic, barium and manganese in background and OU5 are similar

OU5 RFI/RI - JANUARY 9, 1995

STATISTICAL ANALYSIS - GROUNDWATER

Inorganic Analytes Determined to be Statistically Above Background

- Americium-241 (total)
- Plutonium-239/240 (total)
- Strontium-89/90 (total, dissolved)
- Uranium-233/234 (total)
- Uranium-238 (total, dissolved)
- Aluminum (total)
- Barium (total, dissolved)
- Cadmium (total)
- Chromium (total)
- Copper (total)
- Lead (total)
- Magnesium (total, dissolved)
- Mercury (total)
- Nickel (total)
- Silicon (total)
- Strontium (total, dissolved)
- Vanadium (total)
- Plutonium-238 (total)
- Radium-226(total, dissolved)
- Uranium-235 (total, dissolved)
- Arsenic (total, dissolved)
- Beryllium (total)
- Calcium (total, dissolved)
- Cobalt (total, dissolved)
- Iron (total, dissolved)
- Lithium (total)
- Manganese (total, dissolved)
- Molybdenum (total)
- Potassium (total, dissolved)
- Silver (total)
- Tin (total)
- Zinc (total)

OU5 RFI/RI - JANUARY 9, 1995

STATISTICAL ANALYSIS - GROUNDWATER (CONT.)

- Total arsenic, beryllium, cadmium, cobalt, mercury, and silver retained based on results of hot-measurement test
- Total molybdenum and tin and dissolved arsenic and cobalt retained based on graphics
- Distributions of total selenium in background and OU5 samples similar, therefore total selenium eliminated
- Concentration of total and dissolved sodium higher in background than in OU5

OU5 RFI/RI - JANUARY 9, 1995

STATISTICAL ANALYSIS - SURFACE WATER

Inorganic Analytes Determined to be Statistically Above Background

- Americium-241 (total)
- Uranium-233/234 (total, dissolved)
- Uranium-238 (total, dissolved)
- Barium (total, dissolved)
- Calcium (total, dissolved)
- Iron (dissolved)
- Lithium (total, dissolved)
- Magnesium (total, dissolved)
- Sodium (total, dissolved)
- Strontium (total, dissolved)

- Dissolved iron retained based on hot-measurement test

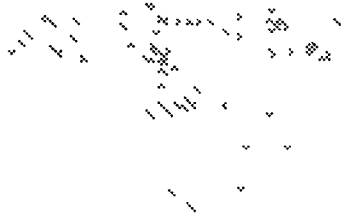
- Distributions of plutonium-239/240 in background and OU5 similar, therefore plutonium-239/240 eliminated

OU5 RFI/RI - JANUARY 9, 1995

STATISTICAL ANALYSIS - SEEP WATER

Inorganic Analytes Determined to be Statistically Above Background

- **No inorganic analytes determined to be significant**



OU5 RFI/RI - JANUARY 9, 1995

STATISTICAL ANALYSIS - POND SEDIMENTS

Inorganic Analytes Determined to be Statistically Above Background

- Americium-241
- Uranium-233/234
- Uranium-238
- Arsenic
- Beryllium
- Chromium
- Copper
- Lead
- Magnesium
- Mercury
- Potassium
- Vanadium
- Plutonium-239/240
- Uranium-235
- Aluminum
- Barium
- Calcium
- Cobalt
- Iron
- Lithium
- Manganese
- Nickel
- Strontium
- Zinc

- Mercury retained based on hot-measurement test
- Concentrations of selenium in background higher than OU5

OU5 RFI/RI - JANUARY 9, 1995

STATISTICAL ANALYSIS - SEEP SEDIMENTS

Inorganic Analytes Determined to be Statistically Above Background

- Uranium-233/234
- Uranium-238
- Beryllium
- Potassium
- Uranium-235
- Antimony
- Nickel
- Zinc

- Antimony retained based on hot-measurement test

OU5 RFI/RI - JANUARY 9, 1995

STATISTICAL ANALYSIS - STREAM SEDIMENTS

Inorganic Analytes Determined to be Statistically Above Background

- Americium-241
- Tritium
- Copper
- Selenium
- Plutonium-239/240
- Arsenic
- Mercury
- Zinc

- Copper, mercury and zinc retained based on hot-measurement test

OU5 RFI/RI - JANUARY 9, 1995

APPLICATION OF PROFESSIONAL JUDGEMENT

SURFACE SOILS

- Highest concentrations in samples from central portion of Original Landfill (IHSS 115) - associated with relatively high concentrations of organics in surface soils and other media
- No metals or radionuclides identified by statistical analysis eliminated

SUBSURFACE SOILS

- Iron eliminated because it is an essential nutrient
- Close association of metals and radionuclides with waste identified during drilling
- No other metals or radionuclides identified by statistical analysis eliminated

OU5 RFI/RI - JANUARY 9, 1995

APPLICATION OF PROFESSIONAL JUDGEMENT

GROUNDWATER

- Due to limited number of samples, spatial and temporal analysis is difficult
- Calcium, iron and magnesium eliminated because they are essential nutrients
- Cesium-137 and strontium-89/90 eliminated - fission products with no known history of production at RFETS
- No other metals or radionuclides identified by statistical analysis eliminated

OU5 RFI/RI - JANUARY 9, 1995

APPLICATION OF PROFESSIONAL JUDGEMENT

SURFACE WATER

- Calcium, magnesium and sodium eliminated because they are essential nutrients
- Barium, lithium and strontium increase with distance downstream - retained for further evaluation
- Highest activities of most radionuclides in sampling stations within SID - retained for further evaluation
- No other metals or radionuclides identified by statistical analysis eliminated

OU5 RFI/RI - JANUARY 9, 1995

APPLICATION OF PROFESSIONAL JUDGEMENT

SEEP WATER

- No further evaluation of inorganics

POND SEDIMENTS

- Calcium, iron and magnesium eliminated because they are essential nutrients
- No clear distribution of inorganics within either pond or between ponds
- No other metals or radionuclides identified by statistical analysis eliminated

OU5 RFI/RI - JANUARY 9, 1995

APPLICATION OF PROFESSIONAL JUDGEMENT

SEEP SEDIMENTS

- Potassium eliminated because it is essential nutrient
- Limited number of samples precludes meaningful evaluation of spatial distribution
- No other metals or radionuclides identified by statistical analysis eliminated

OU5 RFI/RI - JANUARY 9, 1995

APPLICATION OF PROFESSIONAL JUDGEMENT

STREAM SEDIMENTS

- Arsenic concentrations increase with distance downstream in Woman Creek (WC) and SID - retained as PCOC
- Copper, mercury and zinc concentrations relatively high in SID but relatively constant in WC - retained as PCOCs
- Selenium concentrations remain relatively constant with distance downstream and most at or below detection limit - eliminated as PCOC
- Americium-241, plutonium-239/240, and tritium activities relatively high in SID and remain relatively constant in WC - retained as PCOCs

CONTAMINANTS OF CONCERN TECHNICAL MEMORANDUM MEETING

January 9, 1995

8 30 a m

	Name	Company	Phone	Fax
1	Carol Bicher[illegible]	EG&G	966-9100	966-8663
2	Carl Spreng	CDPHE	692-3358	759-5355
3	Diane Nedzwecki	CDPHE	692-2651	782-0188
4	Scott Hollowell	EG&G	966-8748	966-8663
5	Doug Demison	ASI	980-0036	980-1206
6	Rotha Randall	EG&G	966-6924	966-8663
7	Mary Lee Hogg	ICF-K	966 8716	966 8663
8	Mike Kelly	Dames & Moore	299-7876	299-7977
9	Mary Siders	EG&G	966 [illegible]	966-8704
10	Theresa Lopez	PRC	295-1101	295-2818
11	Bonnie Lavelle	EPA	294-1067	294-7559
12	1 Steve Slaten	DOE	966-4839	4728
13	Robert Cygnarowicz	EG&G	966-8601	966-8663
14				
15				
16				
17				
18				
19				

Jan. 9, 1995 COC TM mtg pg 1/7

① Steve Slaten is filling in for Kurt Muenchow, DOE; Ed Mast will not be at this mtg.

② DEC 7, 1995 Data

Open Items

ⓐ IHSS 209 - 1 hit of Pu - will include in Uncertainty Section of RA
Diane discussed w/ Joe
CB discussed (phone) w/ Joe & he concurred

ⓑ Streamline Risk Assessment for IHSS 115 & 196 - CDPHE's approval was an open issue:
- Mike Kelly - already completed work in EATM
- Bonnie - clear guidance on PR streamline RA
- Maryl - comparison of MCL's
- Win - ARAR's analysis
- Ciggy - the panel may change ~~to a FS~~ the PR of the Orig Land to an FS which change RA back to traditional anyway

CB - should we stay w/ trad RA appr

Jan 9, 1995 COC TM mtg continued pg 2/7

Bonnie
Key decision - do we have to do anything? what drives it?

Ciggy
Diane - discussed w/ Joe and he is looking for flexibility in approaching this
Bonnie - Region 8 looks for RME scenario
Mike Kelly - ARARs analysis to identify the heavy hitters & move through the RA to risk calcs.
Bonnie & Win - if you go this far, might as well do Trad RA
Ciggy & Mary - potential panel will be further looked at
Bonnie - has pres remedy been dump
Ciggy - no, not ready to make that decision
CB - At this time want to be more conserva so as not to have to re do down the line.
Bonnie - reasonable max exposure scenario
Carl - residential?
Bonnie - whatever is reasonable
Ciggy - will document a DAA in the Pres Remedy so it is a defensible justification

Jan 9,95 COC TM Mtg continued

Resp to Com. on Stat. Evals continued

a) How stat tests were applied to data? see overhead handout:
Statistical Analysis of Data
- used a conservative approach
~~to applicable~~ was agreed to by
- Bonnie - is this what Gilbert
- Doug - Gilbert referenced tests that has criteria, but he did not specify
- looked at many tests & usually 40-50% detects were not used
- left in data if questionable to be more conservative
- will not argue things out if they won't pass the contox screen
- per media - see overhead handout, stat test showed no significant
(i) surface soil
- Am 241 retained as PCOC due to one high hit @ ZC9
- Antimony

Jan 9,95 COC TM Mtg continued

per media continued
(ii) subsurface soil
manganese is an essential nutrients (Region 8) & a comparison w/ RDA may be all you do & not even through Contox screens
(iii) GW
(iv) SW
(v) seep water
no inorganic analytes determined to be significant
(vi) pond sediments
(vii) seep sediments
- graphics supported stat tests
- low sample size, so returned
- 2 seeps on 1455/115, one on east side, one SE of central part of landfill but w/in 115
(viii) stream sediments
- return in the SID

Attachment 6

Jan 9, 95 OOC TM mtg continued

pg 7/7

- Response to Comments on Professional Judgement - see overhead handouts
  - (i) surf soil
  - (ii) subsurf soil
  - (iii) GW
    - correlation coef of tot metals
    - n=3
  - (iv) SW
    - Bonnie - is SW still being collected?
      - ERA will probably do high/low flow comparison w/ HHRA?
    - Doug - HDS does do high flow/low flow comparisons
  - (v) seep sediments
  - (vi) stream sediments
- ~~Summary~~ Resp to Comm Sheets
  ref pg A-1 ll qual.
  ref in data eval ~~est~~ guidance

by Jan 13
friday - verbal agreement from Bonnie & Carl that comment response are OK or how they need to be changed.

→ CB - need letter re get w/ Mc core log tracking

EPA
x Bonnie Lavelle [signature]
CDPHE
x Carl Spreng [signature]

Steve Slaten for Kurt Muenchow, DOE [signature]